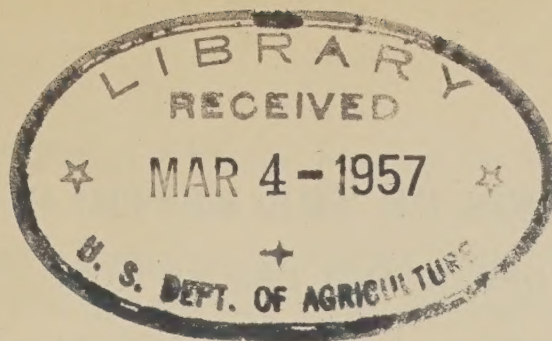


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United States Department of Agriculture,
BUREAU OF PLANT INDUSTRY,
Seed and Plant Introduction and Distribution,
WASHINGTON, D. C.

DISTRIBUTION OF THE RUSTIC CITRANGE
IN 1907.

In the course of the experiments conducted by the Office of Plant Breeding Investigations of this Bureau, several new hardy citrus fruits, or citranges, have been produced, which are believed to possess special value for general cultivation in the southern sections of the United States.

Cooperative arrangements were made by which the trees of the new varieties are to be distributed through this Office, and Dr. Herbert J. Webber, Physiologist in Charge of Plant Breeding Investigations, has prepared this circular especially to accompany the trees of the Rustic citrange.

LISLE MORRISON,
Assistant in Charge.

Approved:

B. T. GALLOWAY,
Chief of Bureau.

WASHINGTON, D. C., *March 2, 1907.*

DISTRIBUTION OF THE RUSTIC CITRANGE.

ORIGIN AND DESCRIPTION.

For several years the Department of Agriculture has had in progress experiments in the production of hardy frostproof oranges. The Trifoliolate orange, which is grown extensively as a hedge plant in the southern United States, endures cold winters without injury as far north as New York. The fruit of this orange is small, very acrid, gummy, seedy, and inedible. In the course of the experiments this hardy species was crossed with the ordinary sweet orange, with the object of producing hybrids combining the hardy, cold-resisting character of the Trifoliolate species with the desirable fruit qualities of the sweet orange. From the numerous crosses made by the writer, in conjunction with Mr. W. T. Swingle, of the Department of Agriculture, a number of hybrids were produced, and several of these which have been grown and tested give evidence of being of considerable value. These new hybrid fruits are very different from the orange, lemon, lime, and other members of the citrus family, and have been named citranges.

One of these new varieties, or citranges, which is a hybrid of the Trifoliolate orange used as the mother parent with the common orange as the father parent, has, with the approval of the Secretary of Agriculture, been named the "Rustic." A technical description of the Rustic citrange follows :

Fruit nearly spherical, of medium size, from 2 to 2 $\frac{1}{8}$ inches in diameter and from 2 to 2 $\frac{3}{4}$ inches in height; weight medium, averaging about 5 $\frac{1}{2}$ ounces per fruit, density lighter than water; color light yellow (by Ridgway's standards chrome yellow); surface covered with small, inconspicuous hairs, fairly smooth, with small indentations over some of the oil glands, as smooth as any sweet orange, frequently with slight furrows radiating from the stem and extending toward apex of fruit, but seldom reaching beyond middle of fruit; calyx persistent but inconspicuous, as in ordinary orange; rind medium thin, one-eighth to seven thirty-seconds of an inch in thickness, adhering rather close to fruit, as in ordinary orange, bitter to taste; oil glands prominent, mainly round or pear shaped, with major axis at right angles to surface; pulp light, translucent, greenish yellow, similar to the pulp color of ordinary lemons (by Ridgway's standards nearest to primrose yellow, but this color is not exactly correct); pulp vesicles small and slender, not so juicy and melting as the Rusk, Coleman, or Savage citrange; segments 6 to 12, separating membranes rather thicker and firmer than in ordinary orange, slightly bitter; texture of fruit moderately tender; axis small, one-fourth of an inch in diameter; flavor a characteristic citrange acid, with some bitterness, rather similar to the Willits citrange; number of seeds variable, some fruits having as high as 24 seeds while others are seedless; aroma light but pleasant; tree similar to ordinary sweet orange, spreading and branched below, differing in this regard from other citranges; vigorous and cold resisting, evergreen or semi-evergreen, of medium height and shapely; leaves trifoliolate, dark green, larger than those of Trifoliolate orange; season of maturity medium early, from the middle of September to the last of November.

The tree of the Rustic citrange budded on Trifoliate stock differs considerably in shape from that of any of the other citranges, developing fairly long lower branches, which are more widely spreading than in the Trifoliate orange or the other citranges and give the tree greater breadth near the ground. The tree of the Rustic citrange is therefore in shape much nearer to that of the ordinary sweet orange. In the other citranges there are fewer large branches developed near the ground, and these have a tendency to grow erect and stiff, giving the tree a shape more nearly like the Trifoliate orange. The foliage of the Rustic citrange is dense, dark green, and mainly evergreen, and the twigs, as in the case of all of the citranges, are armed with long, stiff spines. This variety therefore possesses all of the characters which fit it for use as a hedge plant. The fruits of the Rustic citrange in the seasons of 1904 and 1905 developed numerous seeds, ranging usually from 12 to 24 seeds per fruit. In 1906, however, for some unknown reason, almost all of the fruits were nearly seedless. If the variety is to prove satisfactory for hedge purposes, seedy fruits are needed, and it is desirable to learn what factors are conducive to seed production. The writer's experience at the present time is not sufficient to enable him to give intelligent suggestions, but he believes that ordinarily a sufficient number of seeds will be produced to use for propagation purposes. While the seedlings will doubtless vary somewhat, from the experience with the citranges up to the present time they almost invariably produce seedlings with the foliage characters like those of the parental variety. Cuttings from the citranges can be rooted fairly easily in hot-houses with bottom heat, and it may prove practicable to propagate trees in this way. Satisfactory stock for planting hedges could be secured by budding onto Trifoliate orange stocks, but this would make the plants rather too expensive for hedge purposes.

As in the case of the Savage citrange, it is believed that the Rustic variety might also prove a desirable hardy stock on which to bud the various clons of the ordinary sweet orange, lemon, etc. If it develops sufficient seeds from which stocks may be grown, the writer would suggest its careful trial for this purpose.

While the fruits of the Rustic variety are not so large or juicy as some of the other citranges, they are nevertheless of fairly good quality and, as in the case of other citranges, make a good citrangeade and may be used in making marmalades, pies, cakes, etc.

HARDINESS.

The tests made of the Rustic citrange indicate that it is much less susceptible to injury by cold than the ordinary orange. Young trees in northern Florida have endured severely cold weather, when the thermometer registered from 15° to 18° F., without losing their leaves. In

tests at the Georgia and Alabama agricultural experiment stations the trees of this variety have also shown themselves to be very hardy.

It is believed that the trees can be grown without protection in South Carolina, Georgia, northern Florida, Alabama, southwestern Tennessee, Mississippi, Louisiana, eastern and southern Texas, southern Arkansas, southern Arizona, southern New Mexico, and the warm regions of low altitude in California, Oregon, and possibly Washington. The distribution of the stock of this variety by the Department of Agriculture will be limited to these sections.

CULTIVATION.

The Rustic citrange is not recommended for commercial cultivation on a large scale. While the fruit is of undoubted value, it does not compare in quality with the fine oranges of Florida and California and is to be classed more nearly with the lemon than with the orange. It will more nearly take the place of the lemon and lime than the orange, and its great value will probably be for cultivation as a fruit for home use. As indicated above, it should also be tested as a hedge plant and as a hardy stock for the tender sorts of citrus fruits.

The trees for distribution are budded on hardy Trifoliate orange stocks. The buds were inserted low on the stocks, and the point of the union of the stock and scion can in most cases be distinguished about 3 to 6 inches above the roots.

No special soil can be recommended at present for the citrange, as our experiments with the variety are as yet too limited. The soil should be fairly high and thoroughly drained.

In planting, follow the ordinary practice employed with other fruit trees, such as peach trees, pear trees, etc. The tree of the Rustic citrange grows to a height of from 15 to 20 feet, or more, with a top from 10 to 12 feet in diameter.

In most soils the trees must be manured if they are to give satisfactory results. Citrus trees in general require a fertilizer high in potash content. The ordinary orange-tree fertilizer contains from 3 to 4 per cent of ammonia, 5 to 6 per cent of phosphoric acid, and from 10 to 13 per cent of potash. The citrange should probably be cultivated in general about the same as peach trees, pear trees, or orange trees.

Ordinarily citrus trees are not pruned, except when young to guide and shape the first growth. It is believed that very little or no pruning will be necessary with the citrange.

The trees distributed are buds from seven to eight months old, and if they receive proper care they should produce their first fruit in from three to four years after planting.

REPORT OF RESULTS DESIRED.

The cultivation of the citrange is as yet experimental, as the fruit is new and comparatively untried. The extension of the cultivation of the different varieties and the results obtained with them will form an interesting item in the annals of American horticulture. It is earnestly urged that all persons who receive the trees give them special care. A record will be kept by the Department of Agriculture of the name and address of every person to whom stock is sent, and in due time reports will be requested from each one on the condition of the trees and the results obtained. The trees sent out are of considerable value in view of their limited number and the fact that stock of these trees can not be obtained elsewhere. Persons who receive trees are urged to aid the Department in introducing and establishing the variety by making notes on the trees as to hardiness, behavior under the methods of fertilization and cultivation given, character of soil, and value and uses of the fruit, etc., and be prepared to furnish the Department with a careful record in regard to the results obtained.

PUBLICATION ON THE RUSTIC CITRANGE.

A detailed report has been prepared, giving an account of the experiments which led to the production of the Rustic citrange and containing colored and photographic illustrations of the fruit. As soon as this report is printed a copy will be sent to every person who has received trees of the variety.

HERBERT J. WEBBER,
Physiologist in Charge of
Plant Breeding Investigations.

Approved:

A. F. WOODS,
Assistant Chief of Bureau.

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